

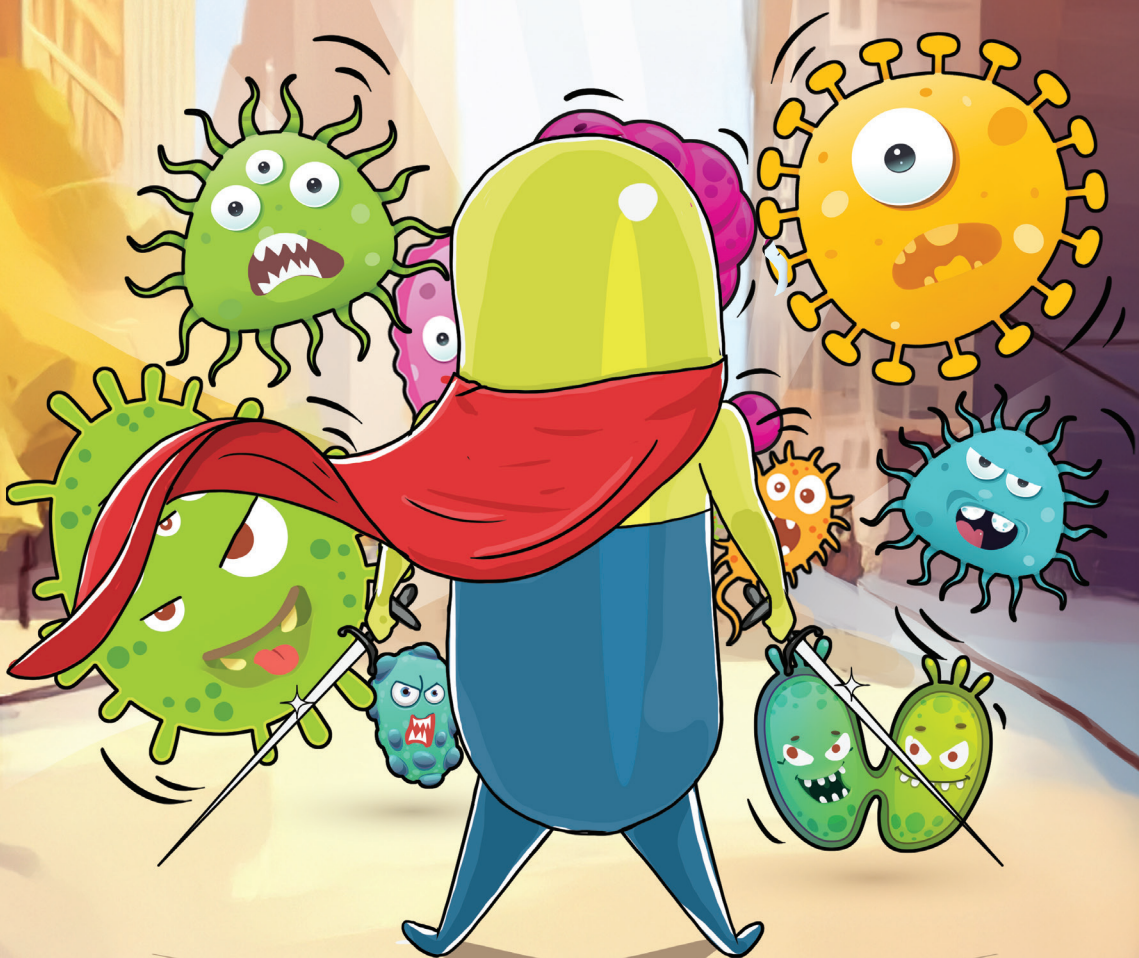
gobar times

Issue no. 270, November 1–30, 2024

A DOWN TO EARTH SUPPLEMENT FOR THE YOUNG AND CURIOUS

BUGS VS. DRUGS

Get ready for the epic battle between
superbugs and antibiotics, and discover
smart tips to protect your health!



ANTIBIOTICS UNDER ATTACK!



Gauri Arora

How a little one's illness exposed the battle between superbugs and antibiotics, and what all we can do to win.



Supplement Editor: Souparno Banerjee **Senior Creative Director:** Ajit Bajaj **Supplement Editorial Coordinator:** Anubhuti Sharma
Design: Ritika Bohra **Illustrations:** Yogendra Anand **Cover Design:** Ajit Bajaj **Production:** Rakesh Srivastava, Surender Singh, Gundhar Das
Email: young@downtoearth.org.in **Snail Mail:** Centre for Science and Environment, 41, Tughlakabad Institutional Area, New Delhi-110062

I t had been almost a week of high fever and stomach aches for my 11-year-old niece, Ira. Having been stuck at home, she longed to go back to school. She missed her friends and was worried about missing her upcoming football match.

“Mummy, my stomach hurts so much. I miss my friends and playing football. When will I start feeling better?” she asked. Ira was in the sixth grade at one of the best convent schools in Delhi.

Ira’s pediatrician suspected typhoid and advised us to get some blood tests done: a Widal test to confirm the infection

meantime, Ira’s pediatrician started her on the antibiotic Cefixime. However, her fever remained stubbornly high.

Antibiotics are medicines that treat bacterial infections by killing bacteria or stopping their growth and multiplication.

When the test results came back a few days later, the pediatrician informed my sister (Ira’s mother): “I’m afraid Ira is infected with a strain of typhoid that requires stronger antibiotics. As this antibiotic must be administered through injection and cannot be taken orally, I recommend admitting her to the hospital.”

subsides. Afterward, she can go home and continue with oral antibiotics for a week,” the doctor explained.

As Ira’s health improved, her mood worsened. She became cranky about staying in the hospital and especially hated the needle inserted into the back of her hand for the antibiotics. During one of the doctor’s rounds, she burst out with questions.

“Doctor, why didn’t the first antibiotic work? I really don’t like needles. Why couldn’t I have this new medicine at home? How many more days do I need to stay here?”

“Woah, someone’s feeling

When bacteria are exposed to antibiotics, weaker bacteria die, but some stubborn ones survive. These are called antibiotic-resistant bacteria. As they grow and multiply, they make antibiotics less effective at treating infections. Some bacteria even become resistant to multiple antibiotics—these are known as ‘superbugs’.

and an antibiotic susceptibility test to determine effective antibiotics. The results revealed that my sweet niece had indeed contracted typhoid, a bacterial infection commonly caused by *Salmonella typhi*.

Typhoid fever usually spreads through food or water contaminated with this bacteria. Common symptoms include high fever, headache, weakness, stomach pain, and diarrhoea.

The results of the antibiotic susceptibility test would take another 2–3 days. In the

We quickly admitted her to a private hospital, where the doctors promptly started the required treatment. To our relief, the stronger antibiotic began to work, and Ira started feeling better.

“Ira is responding well to the antibiotic Ceftriaxone. It’s unfortunate she was infected with such a resistant strain. Nowadays, we must monitor whether antibiotics are working, so we can adjust treatment if needed. We’ll keep her in the hospital for another 3–4 days until her fever

better today!” the doctor laughed. “Don’t worry, Ira. You can go home tomorrow. As for your other questions, here’s the thing: When bacteria are exposed to antibiotics, weaker bacteria die, but some stubborn ones survive. These are called antibiotic-resistant bacteria. As they grow and multiply, they make antibiotics less effective at treating infections. Some bacteria even become resistant to multiple antibiotics—these are known as ‘superbugs.’ Now cheer up; you’ll be home tomorrow!”

Cover Story

My sister thanked the doctor. “Thank you so much for everything, doctor. We’re so glad Ira gets to go home tomorrow. Ira, why don’t you rest now?”

Little did I know that our curious girl had been thinking about the conversation all day.

In the evening, her grandfather Deepak, a general surgeon with over five decades of experience, visited.

“How’s my little girl feeling today? You know we were all so worried,” he asked warmly.

“I’m better now, Daadu, but I don’t like hospitals. I learned

something new today, though—about antibiotics not always working,” Ira said proudly.

“Oh, it’s wonderful that you’re asking such questions, my sweet child,” Deepak Uncle said with a smile.

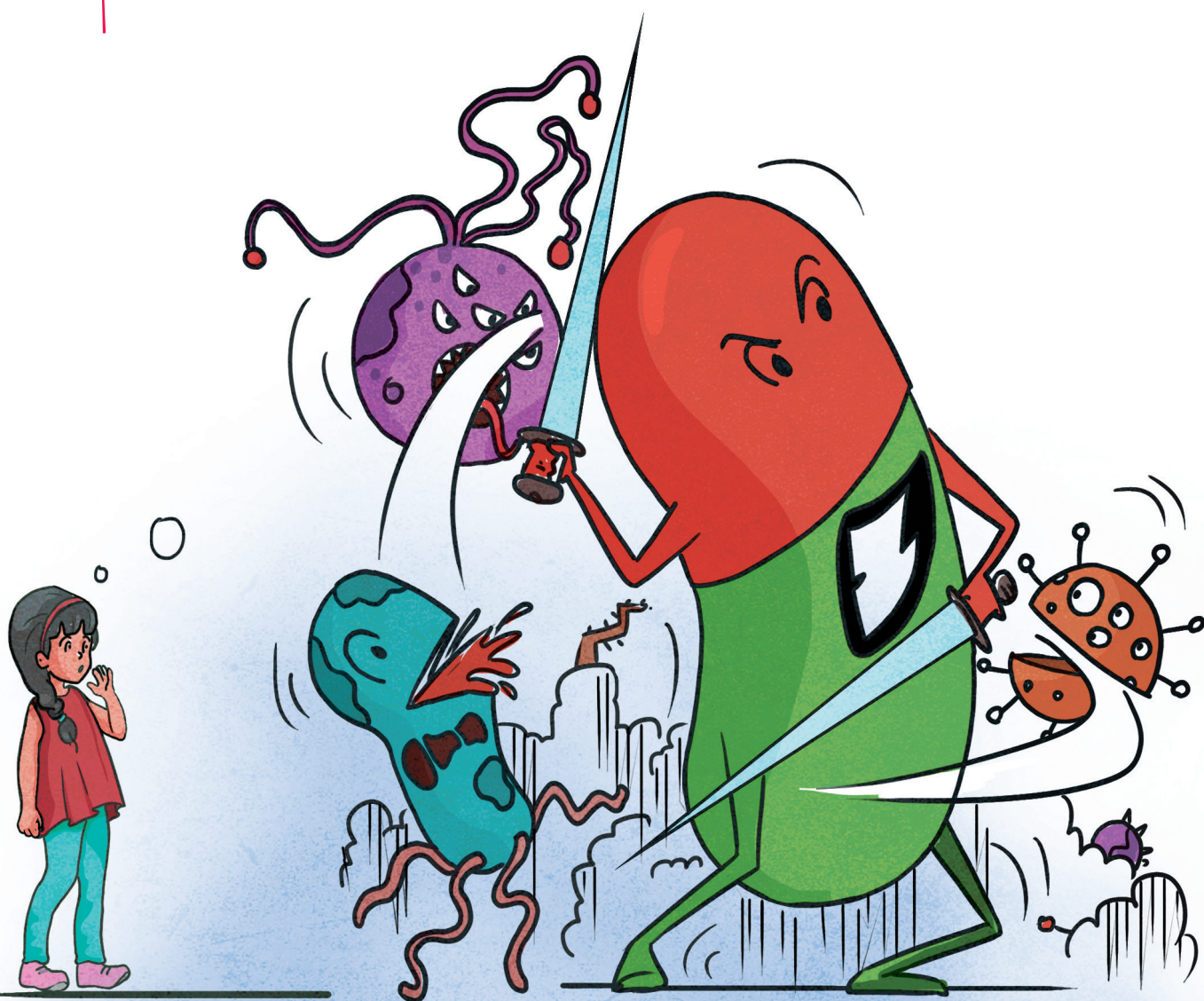
“Has it always been this way, Daadu? Antibiotics not working against infections?”

“No, it wasn’t always like this. When I started practicing medicine in the 1970s, we used to call antibiotics ‘magic bullets.’ They were so effective that even an antibiotic ointment could heal wounds miraculously. Back then, most

antibiotics worked, and new ones were being developed regularly. That period, from the 1950s to the 1970s, was known as the ‘Golden Era’ of antibiotic development. But after that, fewer new antibiotics were developed,” he explained.

“Why did they stop making new antibiotics?” Ira asked.

“Well, pharmaceutical companies found that developing drugs for diseases like cancer was more profitable. Cancer treatments are often long-term and expensive, unlike antibiotics, which are usually taken for a short time.



In the 1970s, we used to call antibiotics ‘magic bullets.’ They were so effective that even an antibiotic ointment could heal wounds miraculously. Back then, most antibiotics worked, and new ones were being developed regularly. That period, from the 1950s to the 1970s, was known as the ‘Golden Era’ of antibiotic development. But after that, fewer new antibiotics were developed.

That’s why there are far fewer new antibiotics in development compared to thousands of drugs for cancer,” he said thoughtfully.

“At least we still have some,” Ira said optimistically. “They’ll be available soon, right?”

“It’s not that simple, my dear. Developing a new antibiotic takes 10–15 years and costs over a billion dollars. By the time it reaches hospitals, it could take another couple of years,” he explained.

“Oh, that long? So by the time we grow up, we might not have enough antibiotics to treat infections?” Ira asked worriedly.

“Yes, that’s a possibility if things don’t change,” her grandfather admitted.

My sister and I were quietly listening to this fascinating conversation.

“As your doctor mentioned, existing antibiotics are becoming less effective, and this problem will only worsen in the coming decades. That’s why it’s crucial to save the antibiotics we have now,” he told Ira, patting her back.

“Really? I can do something to help?” Ira asked eagerly.

“Of course! It all starts with us. You must take antibiotics only when prescribed by a doctor, always complete the full course, and never share them with others,” he explained.

My sister added, “And remember, prevention is better than cure. Practice good hygiene, drink clean water, and eat properly cooked food. Staying healthy means you won’t need antibiotics in the first place.”

“Wow! I had no idea

antibiotics were so important. When I go back to school next week, I’ll tell all my classmates about this!” Ira declared with determination.

Her resolve filled us with hope. This conversation wasn’t just about Ira learning something new; it reminded all of us of the growing global threat of antibiotic resistance and how each of us can play a role in combating it.

When Ira finally returned home, she didn’t just recover physically but also emerged as an advocate for a healthier world. At school, she shared her story and helped her classmates understand why antibiotics should be used wisely. Who knew a painful experience with typhoid would turn into such a meaningful life lesson?

You must take antibiotics only when prescribed by a doctor, always complete the full course, and never share them with others. Practice good hygiene, drink clean water, and eat properly cooked food. Staying healthy means you won’t need antibiotics in the first place.



Neeraj Kumar

When the Blue Sky Disappears

Breathe Easy This Winter: Simple Solutions to Keep Indoor Air Fresh and Healthy Amid Hidden Pollution Sources

Remember those warm summer days? The sun streaming through the trees, early morning walks in the park surrounded by lush greenery, and evening strolls filled with laughter and fresh air. Summer felt like freedom, with open windows, outdoor adventures, and fresh air all around.

But as winter rolls in, everything changes. The days are shorter, and we spend more time indoors, wrapped in blankets and sipping hot tea and coffee. While cozying up inside sounds perfect, we don't always realize that the air we're breathing indoors might not be as fresh as the air we loved in summer. In fact, indoor air can be 2-5 times more polluted than the outdoor air we miss. Sealing up our homes to keep the warmth in also traps in dust, mold, and particles from everyday household items.

So, as we are settling in this winter, let's take a look at some hidden sources of indoor pollution and find simple ways to make the air at home as fresh and clean as those sunny summer memories.

Volatile Organic Compounds (VOCs)

VOCs from everyday household activities can be a significant indoor air pollutant, particularly during winter when homes are sealed to retain warmth.

The Problem

VOCs are emitted by scented candles, cleaning agents, paints, and even traditional incense sticks (*agarbatti*) or *dhoop*. Exposure can lead to respiratory irritation, nausea, and long-term health risks.

The Solution

- **Opt for Natural Alternatives:** Use unscented or naturally derived cleaning products. Limit the use of air fresheners and synthetic fragrances.
- **Increase Ventilation:** Even in winter, open windows for 5-10 minutes daily to refresh indoor air. Avoid this during times of heavy outdoor air pollution, such as during early mornings when smog levels are high in Indian cities.
- **Reduce Burning Rituals:** Limit the use of incense and candles, especially in enclosed spaces. Opt for safer, low-emission options.

Moisture and Mould

Winter in India, especially in humid areas like the coastal regions or during the foggy North Indian winters, can lead to excess indoor moisture and mould growth.

The Problem

Activities like bathing, cooking, and even drying clothes indoors contribute to increased humidity, creating a conducive environment for mould. This can trigger asthma and allergic reactions.

The Solution

- **Control Humidity:** Maintain indoor humidity



Winter air pollution is a common occurrence in many parts of the world – regions with cold climates or weather and dense populations encounter severe air pollution during winters. Air pollution in winters is caused by a variety of factors, including increased use of heating fuels such as wood, coal and oil; more emissions from vehicles because engines get cold and need to warm up; and burning of crop waste by farmers.

Why do we say that air pollution is more severe sometimes in winters? This is because cold temperatures can cause air to become stagnant and remain close to the ground (instead of rising up). This means the pollutants and toxic gases that are carried by the air are also trapped close to the ground – in our breathing zone! Winter air pollution can have serious health consequences, especially for vulnerable populations.

LPG or biogas, which are more energy-efficient and emit less smoke.

- **Improved Stove Design:** Use improved cook stoves that minimize smoke emissions. The Indian government promotes such stoves under schemes like the National Biomass Cook stove Programme (NBCP).
- **Ventilation:** Ensure proper ventilation with chimneys or exhaust fans.
- **Use Seasoned Firewood:** If wood use is unavoidable, ensure it is dried for six months or more to reduce emissions.

- between 30–50 per cent.
- **Address Leaks:** Fix water leaks in roofs, walls, or pipes immediately.
- **Use Exhaust Fans:** Run exhaust fans in kitchens and bathrooms, and leave them on for 15–30 minutes after use.
- **Avoid Indoor Drying:** Where possible, dry clothes outdoors or in well-ventilated spaces.

death. Improper ventilation exacerbates the problem.

The Solution

- **Switch to Cleaner Fuels:** Where possible, replace wood-burning stoves with cleaner alternatives like

The author is a Programme Manager in the Environment Education Unit of the Centre for Science and Environment, New Delhi.

Wood-Burning Stoves and Chulhas

In rural and semi-urban India, traditional cooking methods using wood or biomass in *chulhas* (mud stoves) are still prevalent, especially during winter. While they evoke a sense of nostalgia, these methods contribute significantly to indoor air pollution.

The Problem

Burning wood and biomass releases harmful pollutants like particulate matter (PM_{2.5} and PM₁₀), carbon monoxide, nitrogen oxides, and VOCs. Prolonged exposure can cause respiratory diseases, asthma, heart issues, and premature





Scary Plotter

AND THE
DOCTOR'S
GROAN

PRESENTED BY: SUPER BUGWARTS SCHOOL OF REALITY AND MUGGLES
IN LEAD ROLE: GRAM-POSITIVE AND GRAM-NEGATIVE MULTI-DRUG RESISTANT BACTERIA
IN SUPPORTING ROLE: HOMO SAPIENS SAPIENS (MODERN HUMANS)

Scary Plotter, the name that AMR (antimicrobial resistance) also goes by, becomes the biggest bugbear for Doctors, the healers of the human race, who are left helpless by its evil designs

JOIN OUR FIGHT AGAINST AMR

For details, visit: www.cseindia.org/page/antimicrobial-reststance-programme